

REQUEST FOR PROPOSAL- TECHNICAL

Waterbury Office Complex

Feasibility Study

December 6, 2011

Team:

DEW Construction Corp.

Elkus Manfredi Architects

Keefe and Wesner Architects, P.C.

Stantec

Green Lantern Development

Dubois & King





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December 6, 2011

Ms. Deborah Damore
State of Vermont-Office of Purchasing and Contracting
10 Baldwin Street
Montpelier, VT 05633-7501

Re: RFP Response
Waterbury Office Complex-Feasibility Study

Dear Deborah,

On behalf of our team, we are pleased to submit a response to your RFP for the Waterbury Office Complex Feasibility Study.

DEW has assembled a team of experts to assist the State of Vermont in making a wise decision regarding a permanent home for its employees. This team is assembled in a way to provide a **ONE STOP SHOP** of experts to analyze options quickly and effectively. We understand you are on a tight schedule and this team is ready to serve you.

We have also provided a **DEDUCT of \$70,000** from the Total Cost (please see bid form) if we are selected to analyze all three options. There are cost savings to take advantage of since many of the background and needs analysis requirements can be shared for all of the options.

We look forward to working with you and your team on this project. Please don't hesitate to contact me with any questions regarding this RFP response at (802)735-4739.

Sincerely,

A handwritten signature in blue ink that reads "Matt Young".

Matt Young
Vice President
Preconstruction Services

Cc: Don Wells- D.E.W.

Williston, VT | Hanover, NH

Specializing in Design/Build and Construction Management Services



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Executive Summary

DEW has approached this project as a one stop shop for the State of Vermont. Due to the tight schedule, we felt it was important to have all experts in their field available at a moment's notice. This will allow for an efficient, cost effective and timely response to the requirements of the RFP. This team consists of the following members and their expertise:

- **DEW Construction: Matt Young**
Provide overall project leadership, cost estimating, constructability reviews and schedule
- **Elkus Manfredi Architects: Alan Resnick**
Provide master planning, site planning, sustainable design, programming and schematic design documents
- **Keefe and Wesner Architects: Tom Keefe**
Provide historical preservation, analysis of existing historic buildings
- **Stantec: Gary Santy**
Provide flood design and renewable energy systems engineering
- **Dubois & King: John Benson**
Provide previous analysis of flood mitigation, site/civil, structural, mechanical, electrical and plumbing design input
- **Green Lantern Development: Luke Shullenberger**
Provide financial analysis for payback of renewable energy systems; prepare proforma for privately financed option for renewable energy systems
- **Redstone Development: Larry Williams**
Provide development analysis and options, prepare financial proforma

We understand this a small step compared to the overall scheme of this project, but we feel having the right team advising the State of Vermont will ensure a wise decision has been made for the permanent home for its employees.



Criterion 1: Credentials & Qualifications

Has your team had experience with similar master planning projects of this scope and magnitude?

Our partner Elkus Manfredi Architects, a Boston-based firm with a national reach, is a full-service design firm providing architecture, master planning, urban design, interior architecture, space planning, and programming. Their portfolio of completed work includes the master planning and design of projects that have set the standard for mixed-use development across the country. The planning and design work of Elkus Manfredi Architects is founded on the conviction that the quality of our environment regularly and significantly impacts the quality of our lives. Elkus Manfredi experience with master planning includes:

Westwood Station

Westwood, MA

5,000,000 sf – Offices, Hotels, Recreational space

Fan Pier

Boston, MA

Offices, Retail, Residential, Hotel

(More available upon request – please see additional information tab)

Has team had experience with LEED rated system projects?

All members of our team have LEED experience at different stages of the process whether it's planning, designing or constructing.

DEW Construction:

Completed the first LEED Platinum, Net Zero Education Facility in North America

Completed more than seven projects that have received LEED certification

Elkus Manfredi:

Over 75 LEED accredited professionals on its staff

Designed more than 27 projects that meet the LEED criteria certification

Stantec:

Completed over 150 LEED Projects

Currently providing sustainable design guidance for National Renewable Energy Laboratory (NREL), Golden, CO which aims for LEED Platinum Certification and Zero Energy Building

Has team had experience with high efficiency energy projects? If so, make sure you identify what metric was used to measure/verify the “high energy” efficiencies.

Our engineering partner, Stantec has been the driving force behind some of the most influential projects in North America including the National Renewable Energy Lab for the Department of Energy and the USGBC



headquarters, both noted for extreme energy consciousness. In addition, Stantec is involved in a number of other cutting edge projects like the Sterling Solar Power Project, innovative geo-exchange projects utilizing caissons, biomass plants, micro-turbines, wood chip boilers and combined heat and power.

Stantec has completed:

- *Combined Heat and Power – 15 systems*
- *District Heating – 3 systems*
- *Geo-Exchange – Over 150 systems*
- *Photovoltaics – 50 systems*
- *Wind Power – 15 systems*
- *Wood chip boilers - 5 systems*
- *Utility grade biomass boilers – 10 systems*
- *Landfill Gas Power Generation – 6*

Our partner, Green Lantern Development will be providing proforma analysis of payback of renewable energy systems and the options of a privately financed renewable energy systems.

Has team had experience with historic building analysis and restoration?

Our partner Keefe and Wesner, Architects, specializes in historic preservation projects, and has been the architect for numerous successful preservation projects throughout Vermont; providing on-going consulting for the State and private agencies including the Preservation Trust of Vermont. With Keefe as the principal-in-charge, the firm has reproduced or restored steeples on six historic churches, including one on the battle green in Lexington, Massachusetts, has presented workshops on preservation, and provided expert-witness testimony on HP issues in numerous Act 250 and court cases. Keefe was the principal author of the National Trust publication Locating Telecommunications Towers in Historic Buildings. He has authored numerous CAP Grant Assessments and over 200 historic building assessments, and maintains an active preservation practice with many current projects.

Has team had experience with flood proofing existing and/or new buildings?

Our partner DuBois & King has 47 years of experience in hydrology, hydraulics engineering, and the planning and design of water resource projects. At D&K, a dedicated group of water resource engineers and designers are supported by a staff of environmental specialists, structural engineers, construction managers, and registered land surveyors to provide comprehensive project services.

They perform flood damage surveys, subsurface investigations, evaluation of alternative solutions, design, cost estimating, economic evaluations, environmental analysis, public participation, and report preparation.



DuBois & King has conducted hydrologic and hydraulic studies throughout New England, and we are thoroughly familiar with the hydrology, hydraulic, and physical characteristics of the region. These studies include dam break analyses, flood routing, flood plain and floodway delineation, ice jam analyses, flood frequency and low flow evaluations, reservoir routing, environmental impact assessments, and dam safety inspection and evaluation.

Their in-house project teams are thoroughly familiar with HEC-RAS and HEC-HMS and related software, as well as other hydrologic and hydraulic models such as the National Weather Service DAM-BREAK computer program. We bring a comprehensive understanding of state and federal regulations and procedures for water resource-related projects, and extensive experience and expertise in wetlands, stormwater discharge, dam safety, dredge and fill, and discharge and withdrawal permits.

Projects include:

Flood Plain Analysis and Permitting for State Laboratory Construction

Department of Building and General Services

Waterbury, VT

Floodplain Analysis for Secure Recovery Residence

Department of Building and General Services

Waterbury, VT



Criterion 2: Strength of Design Team

Team shall designate, in writing, a team leader to serve until the expiration of any resulting contract. *Our team leader will be Matt Young, Vice President Preconstruction Services at DEW Construction. Matt's role will be to manage communication from the State of Vermont and to its appropriate consultants and to ensure milestones and deadlines are kept. With this approach, the State of Vermont has a single point of contact and single point of risk. Matt will also ensure proper consultants are present at meetings as needed. DEW Construction will provide instant feedback on cost ramifications of each option being analyzed, its constructability and manage and update the schedule.*

Has the team won any awards for green building design or energy conservation?

Elkus Manfredi has won the following green building design or energy conservation awards:

- *2011 – Best Green Design, Boston/SF Real Estate Awards for 75 Station Landing*
- *2007 – Energy Star Qualified Building – US Environmental Protection Agency for 501 Boylston Project*
- *2007 – Green Development Award – National Association of Industrial and Office Parks for Lazarus Building*
- *2007 – Energy Star Qualified Building – US Environmental Protection Agency for Wellesley Gateway Project*
- *2005 – Smart Growth Award - US Environmental Protection Agency for Belmar Mixed-Use Development*
- *2004 – Phoenix Award - US Environmental Protection Agency for Belmar Mixed-Use Development*

Has the team demonstrated that they have a solid understanding of the technical aspects of the project?

Our Vermont-based team has a solid understanding of all technical aspects involved with this project. We are fully aware of all components of the site. Dubois & King has worked on flood analysis in the town of Waterbury. Elkus Manfredi is a national recognized design firm with extensive experience in master planning and space design. Their expertise combined with our other team members will make us a valuable partner for the State of Vermont.

Has the team worked together before?

Yes, our team members have worked together.



What experience has the team had with designing buildings to “Advanced Building” protocol and “High Performance Design Guidelines”?

Stantec’s engineering team has been the driving force behind some of the most influential projects in North America including the National Renewable Energy Lab for the Department of Energy and the USGBC headquarters, both noted for extreme energy consciousness. In addition, Stantec is involved in a number of other cutting edge projects like the Sterling Solar Power Project, innovative geo-exchange projects utilizing caissons, biomass plants, micro-turbines, wood chip boilers and combined heat and power. Their experience ranges from specialized studies, training, and technical evaluations to complete engineering and program management for the following types of projects: wind power, hydro power, biomass, biogas, waste heat recovery, and solar.

Our partner Elkus Manfredi Architects is a full-service design firm providing architecture, master planning, urban design, interior architecture, space planning, and programming. The planning and design work of Elkus Manfredi Architects is founded on the conviction that the quality of our environment regularly and significantly impacts the quality of our lives. As seen prior Elkus Manfredi Architects has received numerous awards for green/advanced building making them a leader in designing building with high performance guidelines.

Has the team successfully designed biomass heating or co-generation facilities?

DEW has successfully completed more than 7 biomass heating facilities.

Stantec has completed:

- *Combined Heat and Power – 15 systems*
- *District Heating – 3 systems*
- *Geo-Exchange – Over 150 systems*
- *Wind Power – 15 systems*
- *Wood chip boilers - 5 systems*
- *Utility grade biomass boilers – 10 systems*
- *Landfill Gas Power Generation – 6*

Recent Projects completed by Stantec:

Vergennes Train Station, Vergennes, VT – Geothermal System

Falmouth Middle School Biomass Power Plant, Falmouth, ME – Wood Chip Biomass Boiler and steam conversion

UMF Education Center, Farmington ME – Geothermal Heating and Cooling System

MSAD#28, Rockport, ME - Geothermal Heating System

South School Renewable Energy Study, Londonderry, NH – Photovoltaic, Solar Thermal, Biomass, Wind, Oil/Gas Conversion



Has the team had experience with ground water source heating and cooling systems?

Stantec has completed over 150 ground water source heating and cooling systems.

New Hampshire Veterans Home Energy Enhancements, Tilton, New Hampshire: Stantec provided Investment Grade Energy Audit, Geothermal Study for HVAC, plumbing and electrical energy enhancements for this 250 bed facility. Following this phase of the work, Stantec completed the detailed design work and subsequently construction administrative service. This project is currently complete and in operation.

Other recent projects from Stantec:

Vergennes Train Station, Vergennes, VT – Geothermal System

UMF Education Center, Farmington ME – Geothermal Heating and Cooling System

MSAD#28, Rockport, ME - Geothermal Heating System

Has the team had experience with large scale solar PV systems?

Stantec has extensive experience working with large scale solar PV systems completing more than 100 systems . Last year alone they worked on a 30 KW system and an 80 KW system.

Recently completed:

US Fish and Wildlife Energy Measures and Upgrades, RI and CT Visitor Facilities: Stantec was contracted by the U.S. Fish & Wildlife to evaluate renewable energy technologies and perform a general energy audit at several of their Connecticut and Rhode Island facilities. The total project building area was approximately 140,000 sf. Evaluated technologies included wind power, solar power (photovoltaic), solar water heating, low temperature (condensing) boilers, and building envelope upgrades. Projects economics were evaluated using energy modeling software and renewable energy simulation software. Phase II of the project executed the design of a photovoltaic system, condensing boiler upgrade, solar water heating, and building insulation and window improvements.

Does the team include the services of a qualified architectural historian?

Our partner Keefe and Wesner is led by Thomas Keefe who has practiced historic preservation professional design and consulting for 30 years, working for the State Division for Historic Preservation and several architectural firms before starting his own firm in 1987, and the current partnership in 1990. He has chaired the state Advisory Council on Historic Preservation, founded a regional Preservation Trust, been active on various Boards, and has worked on several hundred historic buildings in Vermont and the Northeast.



Criterion 3: Ability to Meet Schedule:

Has the team established a detailed schedule for the project?

We have not prepared a detailed schedule. Preparation of a schedule is included in our services; however, more input from the State of Vermont and their requirements is needed in order for it to be meaningful. We are aware of the schedule as outlined in this RFP and have no concerns on meeting the deadline.

Does the team have sufficient staff to perform in a timely manner?

Yes, our team has sufficient staff to perform this project in a timely. We stand ready to move forward and await the next steps.

Can the team produce reports, documents and drawings within the desired time frame?

Yes, our team can produce reports, documents and drawings within the desired time frame.



Criterion 4: Project Approach

Has the team identified how they will approach the project?

We have first approached this project by creating a single point of contact and risk on behalf of the State of Vermont. DEW will be acting as a lead for this project, thus allowing us to assemble a team with a one stop shop approach, so that all options can be analyzed in an efficient and timely manner. The first meeting with the State of Vermont will be the kick-off meeting mainly to reconfirm expectations, flow of communication, future meetings and preparing an overall schedule with milestones. Subsequent meetings will be charettes with user groups and agency departments who will be involved with the decision making. DEW will take meeting notes, distribute and ensure accountability.

What difficulties have they identified?

At this moment without more input from the State of Vermont, the primary concerns will be receiving timely decisions by user groups and agency departments. We are also concerned about the political ramifications that may slow down our team in receiving decisions by the State of Vermont.

How will they address those difficulties?

We feel constant communication; and a transparent process will help to address these difficulties.



Criterion 5: Fee Structure

Is the fee structure competitive?

We feel as a comparison on similar like project size, our fee for services is very competitive. We have also provided a DEDUCT of \$70,000 if our team analyzes all there options. There will be numerous background data that will and can be applied to all three options. This shared savings will be passed on to the State of Vermont.



Additional Information Requested:

7.2 Background:

DEW Construction Corp. | 277 Blair Park Road | Williston, VT 05495 | (802) 872-0505

Incorporated in Vermont

Date Established: April 11, 1997

7.3 Qualifications:

During the last five years, has the Architectural/engineer design firm or any sub-consultants had a contract terminated for any reason? NO

During the last five years, has the Architectural/engineer design firm or any sub-consultants been assessed any penalties under any existing or past contracts? NO

During the last five years, has the Architectural/engineer design firm or any sub-consultants been the subject of any order, judgment or decree of any federal or state authority barring, suspending or otherwise limiting the right of the Architectural/engineer design firm/subconsultant to engage in any business, practice or activity? NO

Provide a list and summary of any pending or threatening litigation, administrative or regulatory proceedings and provide a statement whether such actions could affect your ability to perform the required services. NO

7.4 Recent and Relevant Project Experience

Please see attached project sheets.



Vermont Federal Credit Union Office Building
South Burlington, VT:
8,446 sf, 3 Story, Office Building with Credit Union Branch



National Life Building
Montpelier, VT:
11,700 sf Renovation, Executive Offices



356 Office Building - Water Tower Hill
Colchester, VT:
53,000 sf, 4 Story, Office Building



354 Office Building - Water Tower Hill
Colchester, VT:
62,000 sf, 4 Story, Office Building



Cleveland Rudman Federal Building
Concord, NH:
Energy Conservation Measures, Upgrades to Lighting Systems

IBM Building 972 Annex
Essex Junction, VT:
35,000 sf, Two Story, Office with Connecting Links to Adjacent Facilities

GSA Office Building
Burke, NY:
29,000 sf Office Building

National Life Building
Montpelier, VT:
Lobby Renovations

GSA Office Building
Williston, VT:
23,000 sf Office Building, 2 story, LEED Registered

Birchwood Office Building
South Burlington, VT:
24,000 sf Office Building, Single Story, LEED Registered



LEED Platinum

- ✓ **Putney School Field House**
Owner: The Putney School
Architect: William Maclay
ID: 1000001644

LEED Gold

- ✓ **UVM James M. Jeffords Hall**
Owner: University of Vermont
Architect: Freeman French Freeman
ID: 10161840
- ✓ **Castleton Campus Center**
Owner: Vermont State Colleges
Architect: JMZ Architects & Planners
ID: 10249331
- ✓ **Champlain College Aiken Hall**
Owner: Champlain College
Architect: Smith Alvarez Sienkiewicz
ID: 10353821

LEED Silver

- ✓ **UVM Wing Davis Wilks Hall**
Owner: University of Vermont
Architect: Smith Alvarez Sienkiewicz
ID: 10001683
- ✓ **Moe's Southwest Grill**
Owner: Moe's Southwest Grill
Architect: Yaw Associates
ID: 10485946

LEED Certified

- ✓ **King Street Housing**
Owner: Housing Vermont
Architect: Lemay & Youkel
ID: 10135194

LEED-Registered

- ✓ **USCIS Office Building**
Owner: Taft Corners Associates
Architect: Wiemann Lamphere
ID: 1000005912
- ✓ **UVM Harris/Millis Residence Hall**
Owner: University of Vermont
Architect: Smith Alvarez Sienkiewicz
ID: 10252342
- ✓ **Birchwood Office Building**
Owner: Birchwood Properties
Architect: Richard Henry Behr
ID: 10380199
- ✓ **Advance Transit
Regional Bus Facility**
Owner: Advance Transit, Inc.
Architect: Wiemann Lamphere
ID: 10479362
- ✓ **Castleton State College
2012 Residence Hall**
Owner: Vermont State Colleges
Architect: JMZ Architects & Planners
ID: 1000009577
- ✓ **Redstone Lofts
The University of Vermont**
Owner: Redstone Development
Architect: Youkel
ID: 1000003519
- ✓ **Boltwood Place**
Owner: Archipelago Development
Architect: Arrowstreet Architects
ID: 10211015

WESTWOOD STATION

Westwood, Massachusetts

Client: Cabot Cabot & Forbes,

New England Development, and The Common Fund



Westwood Station is a five million-square-foot mixed-use neighborhood located along University Avenue, adjacent to the MBTA Station, high-speed Acela rails, and Routes 128 and 95. The land uses proposed will feature lifestyle retail with residences above, several distinct residential neighborhoods, office buildings, hotels, and recreational uses.

The master plan is focused on concentrating a mix of uses in proximity to the MBTA Transit Station, reducing vehicular use, providing shared parking opportunities, and creating a pedestrian-oriented environment for residents, workers, and visitors. At the heart of the district is Market Street — a new main street of activity which will consist of a two-way street, lined with wide sidewalks and attractive landscaping connecting the transit center and the major retail district. Street level retail will include upscale shops and restaurants. The upper stories will accommodate a total of 400 residences planned on three floors. Two-story retail will anchor the southern edge of Market Street and several office tenants will interface at the northern end.

Westwood Station is planned around a network of open spaces including parks, playing fields, and meadows with trails connecting to the Neponset River.

FAN PIER

Boston, Massachusetts

Client: The Fallon Company



Elkus Manfredi Architects provided final master planning services for the Fan Pier site, and building design services for the first office building. The urban design principles that will guide the development of Fan Pier ensure that this will be a pedestrian-oriented neighborhood, and a gateway to the waterfront. The neighborhood is made up of multiple uses — retail, residential, office, hotel, and civic — which will generate visits from a diverse mix of guests, residents, office workers, and visitors. It includes more than eight acres of open space along the waterfront; and it will include important civic institutions, like the new Institute of Contemporary Art, that will attract visitors both day and night.

One Marina Park Drive, the first office building, is located on Northern Avenue between Fan Pier Boulevard and the Public Green. This location affords it an prominent urban presence at the intersection of two important streets as well as a park setting on this great new public green — the park on the waterfront. The building design recognizes these two significant opportunities with a two-story retail base on the street level of Fan Pier Boulevard and Northern Avenue, and a continuous 18-story curtainwall on the park, which will provide long range views to the harbor and well beyond. This will be a landmark, sustainable building, designed specifically to its surroundings and to its different city and water orientations.

STANTEC PROJECT EXPERIENCE

Lempster Wind Project, New Hampshire San Jose Unified School District, San Jose, California



- Combined Heat and Power – 15 systems
- District Heating – 3 systems
- Geo-Exchange – Over 150 systems
- Photovoltaics – 50 systems
- Wind Power – 15 systems
- Wood chip boilers - 5 systems
- Utility grade biomass boilers – 10 systems
- Landfill Gas Power Generation – 6
- LEED Projects – Over 150

New Hampshire Veterans Home Energy Enhancements, Tilton, New Hampshire:

Stantec provided Investment Grade Energy Audit, Geothermal Study for HVAC, plumbing and electrical energy enhancements for this 250 bed facility. Following this phase of the work, Stantec completed the detailed design work and subsequently construction administrative service. This project is currently complete and in operation. *Client Reference: Gordon J. Graham, PE, Project Manager, 603.271.6659*



US Fish and Wildlife Energy Measures and Upgrades, RI and CT Visitor Facilities:

Stantec was contracted by the U.S. Fish & Wildlife to evaluate renewable energy technologies and perform a general energy audit at several of their Connecticut and Rhode Island facilities. The total project building area was approximately 140,000 sf. Evaluated technologies included wind power, solar power (photovoltaic), solar water heating, low temperature (condensing) boilers, and building envelope upgrades. Projects economics were evaluated using energy modeling software and renewable energy simulation software. Phase II of the project executed the design of a photovoltaic system, condensing boiler upgrade, solar water heating, and building insulation and window improvements. *Client Reference: Kevin Ortyl, Regional Facility Manager, 413 253 8200*



National Renewable Energy Laboratory (NREL), Golden, CO

This new signature 220,000-square-foot administration building is the gateway to the National Renewable Energy Laboratory campus in Golden, Colorado. Stantec is providing mechanical and electrical engineering design services and sustainable design guidance for this project, which aims for LEED Platinum Certification and Zero Energy Building (ZEB) under the strict definition from NREL. We are providing extensive thermal and energy modeling to maximize the passive performance of this facility. Energy saving design strategies include robust natural ventilation strategies, hydronic radiant slab heating and cooling, displacement ventilation, passive air preheat via transpired collectors, a below-grade remote mass labyrinth to store thermal energy, and extensive heat recovery and daylight harvesting to meet an energy target of more than 50 percent better than code. One hundred percent of all typical work spaces are designed to receive adequate daylight (based on LEED criteria) by utilizing a narrow floorplate and an advanced light bouncing device on the south face of the building. A huge photovoltaic array will be integrated into the building roof and adjacent visitor's parking lot, which will be designed to produce more energy than the facility will use in a year. The project received the ACEC Grand Award of Engineering Excellence in 2011.



Whittingham Elementary School & Twin Valley Middle School Woodchip Heating Plant, Whittingham, VT

Mechanical, electrical, structural, site/civil & commissioning engineer responsible for a 3MMBTU woodchip hot water boiler located stand alone boiler plant for a 60,000-square foot elementary & middle school facility.

Client Reference: Jon Carrier, Facility Manager, 802.368.9388

Fairbank Scale Energy Audit, St. Johnsbury, VT: Stantec identified and evaluated energy saving projects at the 250,000 sf manufacturing facility. Mechanical HVAC systems condition with respect to operations and maintenance was also assessed. Identified measures included manufacturing space air-to-air heat recovery, constant to variable air flow conversion air handling systems, controls enhancements such as equipment scheduling and space temperature setbacks. With respect to the large, high pressure steam heating plant, evaluated upgrade options included conversion to hot water, fuel switching, variable feed feedwater pumping, and fuel oil transfer system modifications. Energy and economic evaluations were made utilizing a combination of energy modeling software, renewable energy technology simulation software, and comprehensive BIN analysis spreadsheets.



Client Reference: Eric Chadburn, Facility Manager, 802 473 5253

Other Recent Projects

Vergennes Train Station, Vergennes, VT – Geothermal System

Falmouth Middle School Biomass Power Plant, Falmouth, ME – Wood Chip Biomass Boiler and steam conversion

UMF Education Center, Farmington ME – Geothermal Heating and Cooling System

MSAD#28, Rockport, ME - Geothermal Heating System

South School Renewable Energy Study, Londonderry, NH – Photovoltaic, Solar Thermal, Biomass, Wind, Oil/Gas Conversion

One Team. Infinite Solutions.

STATE-OWNED BUILDINGS FLOOD DAMAGE MITIGATION STUDY DEPARTMENT OF BUILDING AND GENERAL SERVICES WATERBURY, MONTPELIER, AND BERLIN, VERMONT



OVERVIEW

Flood mitigation study of 67 State-owned buildings in the Winooski River Watershed. Conducted detailed field inspections and inventories and recommended discrete mitigation measures for each building.

PROFESSIONAL SERVICES

The DuBois & King Water Resources Team performed the following primary tasks:

- Inspected all 67 buildings
- Determined 100-year flood elevation at each building using FEMA flood insurance studies.
- Inventoried building penetrations below the flood elevation.
- Documented building use and contents below flood elevation.
- Estimated flood damage costs for structural and architectural features, mechanical systems, and contents.
- Developed a flood damage potential severity ranking to prioritize mitigation efforts.
- Recommended mitigation measures for each building including floodproofing and content relocation.

FLOODPLAIN ANALYSIS FOR SECURE RECOVERY RESIDENCE DEPARTMENT OF BUILDING AND GENERAL SERVICES WATERBURY, VERMONT



OVERVIEW

For project architect, D&K performed floodplain analysis and evaluation of permitting implications for the proposed Secure Recovery Residence (SRR) located in the Winooski River floodplain. The proposed site is on the floodplain fringe where development is generally permitted, rather than the highly restricted floodway near the channel. However, the local municipal floodplain ordinance included a requirement to evaluate the hydraulic impact of development anywhere in the floodplain. DuBois & King's hydraulic analysis showed that the proposed building would result in a minor increase in the 100-year baseflood elevation that would be acceptable under federal rules. Evaluated an initial proposed location and an alternate nearby site, both within the Waterbury complex.

PROFESSIONAL SERVICES

The DuBois & King Water Resources Team performed the following primary tasks:

- Surveyed new river and floodplain cross section as well as sill elevations of potentially impacted residences.
- Used the HEC-RAS hydraulic model to determine the 100-year baseflood elevation with and without the proposed building.
- Prepared letter reports to document the results.
- Identified flood risks associated with new building at the site and recommended design measures to mitigate the risks.

FLOODPLAIN ANALYSIS AND PERMITTING FOR STATE LABORATORY CONSTRUCTION

DEPARTMENT OF BUILDING AND GENERAL SERVICES

WATERBURY, VERMONT



OVERVIEW

Floodplain analysis and permitting for a proposed State Forensics Laboratory located in the Winooski River floodplain. The proposed site is on the floodplain fringe where development is generally permitted, rather than the highly restricted floodway near the channel. However, the local municipal floodplain ordinance included a requirement to evaluate the hydraulic impact of development anywhere in the floodplain. DuBois & King's hydraulic analysis showed that the proposed building would result in a minor increase in the 100-year baseflood elevation that would be acceptable under federal rules.

PROFESSIONAL SERVICES

The DuBois & King Water Resources Team performed the following primary tasks:

- Surveyed new river and floodplain cross section as well as sill elevations of potentially impacted residences.
- Used the HEC-RAS hydraulic model to determine the 100-year baseflood elevation with and without the proposed building.
- Prepared letter reports to document the results.
- Represented the owner at municipal hearings.
- Prepared municipal floodplain development permit application.

INDUSTRIAL CHP – PAPER MILL

CASE STUDY 1



OVERVIEW:

Biomass CHP plant that provides power and process heat (steam) to a paper mill. The facility provides over 75% of the mill's total electricity needs, and 100% of process heat.

Total Capital Budget: \$11M

FUEL:

Wet bark, whole-tree chips and sawdust.

Equipment & System Details:

2 X 600 HP wood-fired boilers

2x600 kw turbine generators

Fuel/chip storage & handling bunker
Plant building

Deal Structure, Funding & Financing:

Investor-owned, ESCO-managed facility. Turn-key development and 10-year ESCO contract with purchase option or renewal option at expiration of 10-year term.



INSTITUTIONAL CHP - HOSPITAL

CASE STUDY 2



OVERVIEW:

Biomass CHP plant that provides all seasonal heat, summer cooling (thermal chillers), year-round domestic hot H2O and electricity to a hospital.

Total Capital Budget: \$14M

FUEL:

Whole-tree chips.

Equipment & System Details:

600 HP wood-fired boiler
Natural Gas back-up
500 kw steam turbine generator
100 Ton Absorption Chiller
Fuel/chip storage & handling bunker
Plant building

Deal Structure, Funding & Financing:

Self-Owned and operated.
\$500K in grant proceeds. Financing package of low-interest bonds, and. Hospital saves an estimated \$1.1M annually in utility expenditures over previous system.



INDUSTRIAL CHP – DAIRY PROCESSOR

CASE STUDY 3

OVERVIEW:

Energy efficiency upgrade and CHP system installation at an operating dairy, including waste-heat recovery boilers, natural gas reciprocating engine generator and absorption chillers for refrigeration. System dramatically increases efficiency of existing natural gas boilers by capturing waste heat that is used to power absorption chillers for refrigeration. Reciprocating engine generators provide most of dairy's electric demand, and and heat from the generators is captured and used for pre-heating to reduce demand from central boiler.

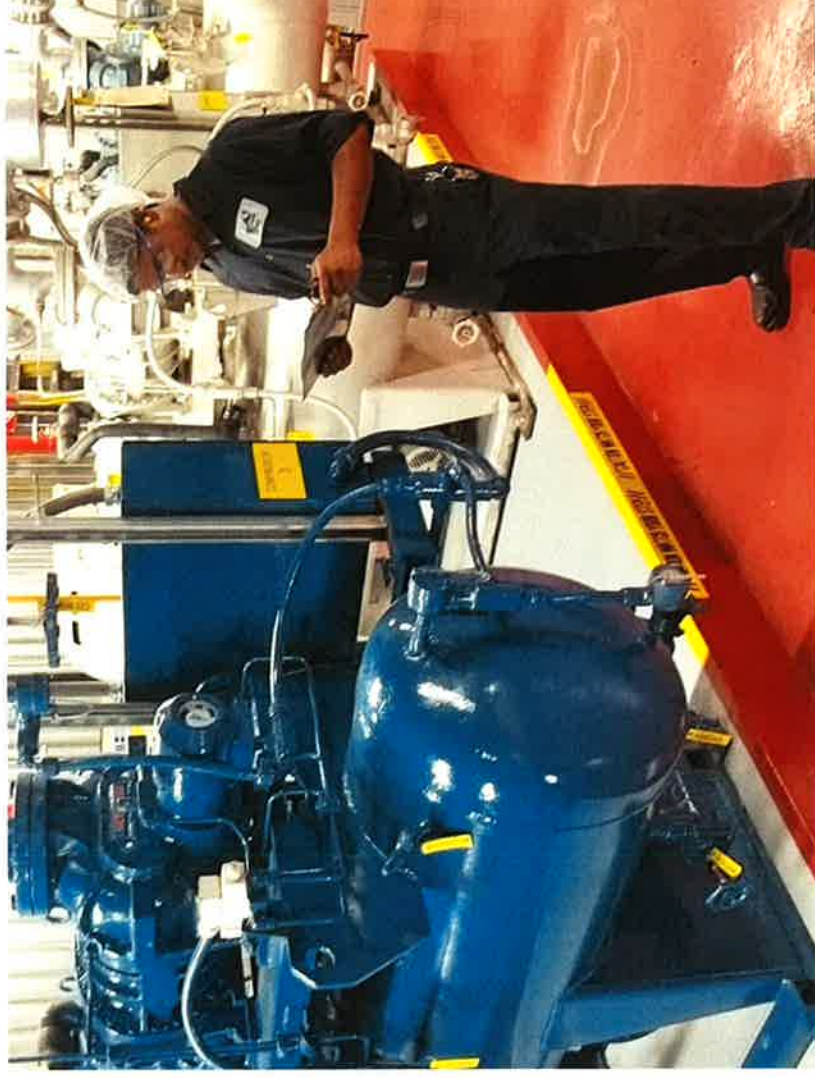
Total Capital Budget: \$5.1M

Equipment & System Details:

- 3 x 750KW Caterpillar reciprocating engine generators
- Waste heat recovery boilers
- Ammonia refrigeration compressors

Deal Structure, Funding & Financing:

7-year Operating Lease with option to purchase at Fair Market Value.



CHP PLANT & DISTRICT ENERGY SYSTEM

CASE STUDY 4 – Slide 1



OVERVIEW:

Biomass CHP plant and community-scale District Heat network supplying the entire campus of St. Johnsbury Academy, the Public School building, and institutional customers on Main St. in downtown St. Johnsbury, VT.

Total Capital Budget: \$13.5M

Output:

600kw electric
20 Million btu/hr thermal.

Equipment & System Details:

- 650 HP Biomass Gasifier
- 450psig steam boiler
- 600kw back-pressure steam turbine.
- Heat Exchanger and District Heat Pumps

Notes: Heat exchanger takes outlet steam from turbine and converts it to 190-200F hot water, and then distributes it via the district heat network to all buildings on campus

Deal Structure, Funding & Financing:

Investor-owned and operated facility, with long-term energy supply contracts (PPA's) with customers.

\$2.85M in private equity funding
\$9.0M in Tax-Exempt Bonds
\$1.3M in grants and incentives
\$350K from REC 's & carbon off-sets



NORTHWEST PERSPECTIVE

MAY 3, 2011



ST. JOHNSBURY ACADEMY DISTRICT HEAT

CHP plant and District Heating Network that supplies summer thermal chilling, year-round domestic hot water, and seasonal heating to approximately 1,000,000sf of buildings.

D.E.W. Construction Corp.

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